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Abstract

This study investigated the effect of insufficient currency in circulation on the rate of inflation and unemployment in Nigeria: The Buhari's Administration Experience; using annual time-series data ranging from 1985 to 2020. In achieving this task, the study was disaggregated into two models: model 1 utilizing Vector Error Correction Model to analyse the relationship between fiscal variables (government total expenditure, government tax revenue, and export) and unemployment rate. It was revealed from the unit root of Augmented Dickey-Fuller test that none of the (fiscal) variables was stationary at level, but they were all stationary after 1st Differencing. This made it necessary for the study to apply Johansen co-integration test which the estimated result indicated 1 co-integration equation as evidenced by Trace statistic. This also, necessitated the application of Vector Error Correction Model (VECM), and it was observed that it took 61.71% annual speed of adjustment towards long-run equilibrium from short-run disequilibrium for unemployment rate to return to equilibrium after a shock to fiscal variables. The results further explained that government total expenditure, and government tax revenue, had negative and insignificant impact on unemployment rate respectively, thereby reducing unemployment rate. Similarly, the estimated result indicated that export had positive impact on unemployment thereby increasing unemployment rate within the period under study. Similarly, in analysing monetary variables (money supply, exchange rate and prime lending rate) in model 2: Phillip-Peron unit root test was conducted and it was confirmed that the variables were of mixed order of integration which necessitated the employment of ARDL technique. The ARDL bounds testing result revealed that a long-run relationship existed between monetary variables, and inflation. It was found, in the long-run, that money supply caused inflation rate to rise. More so, the result further revealed that present level of exchange rate decelerated inflation rate in both long-run and short-run. While, it was further observed that the one-year lag and two-year lag of exchange rate increased rate of inflation in both log-run and short-run respectively. The estimated result further revealed that the present level of prime lending rate minimised the rate of inflation in the long-run and short-run. Whereas, similar results were further confirmed in the one-year lag and two-year lag that prime lending rate reduced inflation rate in both log-run and short-run. As a result of these findings, with respect to model 1; the study recommended that government should maintain the level of its expenditure and tax revenue as this reduced unemployment rate, and it should lower trade costs so that demand for labour would increase in the export industry, this would make aggregate unemployment rate to reduce. With respect to model 2; it recommended the adoption of contractionary monetary policy that would minimise the amount of money supply that caused long-run effect on inflation in the system. Furthermore, there should be proper maintenance of fixed exchange rate policy that will make exchange rate regime overcome non-military forces of demand and supply in exchange rate market, this will help maintain low rate of inflation.

Keywords: *Fiscal and monetary variables, Inflation and unemployment, quantity theory of money, VECM and ARDL.*

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1.0 Introduction

Insufficient currency in circulation is an opposite of currency in circulation, which refers to a total amount of money supply in an economy that is not sufficient enough to trigger inflation. This scenario can be attributed to effect money demand – money demand is referred to the amount of money that people are willing to hold at a given time period, Gbosi (2016), plays in the economy. Early in 2016, just few months the administration of president Buhari came into power Nigeria and Nigerians witnessed unprecedented phenomenon of insufficient money in circulation triggered by Buhari's unfriendly policy of fighting corruption. As we all know, bank is one of the key players in the economic growth and development of a country – within this period, banks in Nigeria experienced shortage of financial assets to carry out their transactions. This happened as a fact, that some of the politicians who (saved) had huge amount of money in the banks withdrew it for the reason of being frozen by Buhari's administration in the name of fighting corruption. Banks suffered unbearable distress. As a result of this scenario, people (savers) who had money in their various bank accounts were finding it very difficult to withdraw, because those of the rich politicians had hastily withdrawn their money, which on the other hand, bank used to operate as they perceived the incoming stringent policy of Buhari's administration and buried it in the ground or hid it elsewhere. Banks' customers queued up at the entrances of various banks in Nigeria within this period to withdraw their deposited money, but were told by some of these banks they don't have enough money to pay out. In the similar vein, ATMs were empty to cash out money to the public. This phenomenon became unabated all through that period – even with the fact that, money was scarcely insufficient in the system then, inflation rate and unemployment keep on rising till now. This situation is seen against monetary theory of inflation which postulates that a sustained increase in the money supply of a country (or currency area).

Depending on many factors, especially public expectations, the fundamental state and development of the economy, and the transmission mechanism, it is likely to result in price inflation, which usually just called inflation, which is a rise in the general level of prices of goods and services (Michael F. Bryan, 2008; Jahan Sarwat, 2004). It is noted that in 1973, Nigeria adopted a truly national currency in decimal form instead of the pounds, to replace the imperial system which she inherited from the British colonial administration. The pounds and shillings were changed to Naira (₦) and kobo (k), and four denominations of notes were issued as follows: 50 kobo; ₦1; ₦5 and ₦10. In response to rapid economic growth made possible by the oil boom, ₦20, and ₦50 note denominations were added in 1977 and 1991 respectively. Considering cost effectiveness and expansion of economic activities, higher denomination notes were issued. These are 100 Naira (1999), 200 Naira note (2000). 500 Naira was released in April, 2001 while the 1000 Naira note was released in October 2005. On February 28th 2007, as part of the economic reforms, ₦50, ₦20, ₦10 and ₦5 banknotes and ₦1 and 50K coins, were reissued in new designs. While a new denomination ₦2 coin was introduced, Central Bank of Nigeria (2021). According to CBN "Currency in circulation can be referred to as currency outside the vaults of the central bank; that is, all legal tender currency in the hands of the general public and in the vaults of the Deposit Money Banks (DMBs),". In arriving at the currency in circulation figure, the CBN adopted accounting/statistical/withdrawals and deposits approach, which monitors movements in currency circulation on a transaction by transaction basis. Put differently, for every withdrawal made by a DMB at one of CBN's branches, an increase in the CIC was recorded. By the same token, for every deposit made by a DMB at one of CBN's branches, a decrease in the CIC was recorded. All the transactions are then recorded in the CBN's CIC account and the balance of the account indicates Nigeria's

total circulated currency. A larger portion of the currency in the country outside the commercial banking system was held by the general public, (the CBN statistics revealed).

The Buhari's administration has been chosen for this study because when he came into power in 2015, in one of his manifestos, was that he's going to eliminate unemployment to a stand-still. Today, there are rising rates of unemployment and inflation that terrorize the economy on a daily basis. It is proposed in economic theory, when there is too much money in circulation that leads to inflation, but this postulation doesn't hold in Buhari's administration. Macroeconomic goals of every government are to maintain price stability in the economy; achieve a low-level of unemployment, facilitate economic growth with low inflation, and attain a favourable balance of payment equilibrium. However, due to inflexible policies of the government of the day that spread wildly like wildfire these goals have suffered setbacks this triggered the economy into recession which Nigeria experienced between 2016 and 2017 that constrained government's effort at generating revenue and implementing national development plans. In order to remedy the situation, the Buhari government introduced the Economic Recovery and Growth Plan (ERGP) in 20017 as a policy option.

The ERGP is designed to diversify the economy, restore economic growth, create jobs, empower the youths, develop the human capital and infrastructure, improve business environment and bring about technological growth. But the success of the ERGP is dependent on the ability of the Buhari-led government to muster the political will and implement the ERGP. Given the fact that, these programmes and/or policies couldn't salvage the economic phenomena of inflation and unemployment. The ineffectiveness of the administration's policies has clearly portended a great danger to the economy. Although, several studies have been performed on this subject, and they have also used different strategies to tackle the problem. However, using this approach would make a more significant difference from techniques used and outcomes found by previous studies. Thus, this study is aimed at determining if the effect of insufficient currency in circulation could be responsible for inflation as opposed to traditional monetarist economic theory which states that too much money in circulation causes inflation or not, and/or government spending reduces unemployment as posited by the Keynesian theory. It is of interest in this study to conduct an analysis on how to solve these problems.

2.0 Literature Review

There is a need to address and/or provide answers to a question raised by the Federal Reserve Bank of San Francisco (FRB, 2002 as cited in Samuel et al.,2019). On factors responsible or contributing to high rate of inflation in a nation. Pinto (1990) as cited in Ditimi et al. (2017) observed that currency devaluation arising from the merger of official and parallel exchange rate diminishes export revenue and ganger causes inflation (Amassoma et al., 2018). The findings of Pinto (1990) as cited in Ditimi et al. (2017) was substantiated in the studies of Egwaikhide et al. (1994); Imimole and Enoma (2011); Kaouther and Besma (2014) and Kamal (2016). The scholars underscored that currency devaluation could plausibly lead to a swift increase in the overall price level of consumer 's products via a unit increase in the production and service cost in the short-term. Similarly, Bawa et al. (2016) observed that inflation exhibited a strong degree of apathy in Nigeria. The finding of Bawa et al. (2016) was buttressed in the findings of Odusanya and Atanda (2010) that GDP growth rate and inflation apathy were significant factors in explaining the inflationary process in Nigeria. Variation in money aggregates, fiscal deficit, external sector disequilibrium, oil prices shocks, and currency devaluation spurs inflationary pressure in Nigeria and other nations. Findings from previous studies validated the submission of the monetarists 'theorem (Bozkurt, 2014).

Conceptual Framework

According to Investopedia, the currency in circulation of a country is currency that is physically used to conduct transactions between consumers and businesses rather than stored in a bank, financial institution or central bank. Currency in circulation is part of the overall money supply, with a larger portion of the overall supply being stored in checking and savings accounts.

Currency in circulation can also be thought of as currency in hand because it is the money used throughout a country's economy to buy goods and services. Monetary authorities of central banks pay attention to the amount of physical currency in circulation because it represents one of the most liquid asset classes. Currency in circulation is less important to central banks' monetary policy relative to other types of money (for example bank reserves) because the quantity of currency is relatively less flexible.

Theoretical Framework

Diverse theories have been propounded to address issues surrounding currency in circulation and rising inflation and unemployment for years, some of these theories argued that there was a stable, inverse relationship between money wages/inflation and unemployment, while some argued that in the long-run there can be no trade-off between inflation and unemployment. Hence, this segment is devoted to review some of these theories.

Quantity theory of money/currency in circulation

The quantity theory descends from Nicolaus Copernicus, followers of the School of Salamanca like Martín de Azpilicueta, Jean Bodin, Henry Thornton, and various others who noted the increase in prices following the import of gold and silver, used in the coinage of money, from the New World. The "equation of exchange" relating the supply of money to the value of money transactions was stated by John Stuart Mill who expanded on the ideas of David Hume. The quantity theory was developed by Simon Newcomb, Alfred de Foville, Irving Fisher, and Ludwig von Mises, although the latter believed demand for money was also a significant factor, in the late 19th and early 20th century. Henry Thornton introduced the idea of a central bank after the financial panic of 1793, although, the concept of a modern central bank was not given much importance until Keynes published "A Tract on Monetary Reform" in 1923. In 1802, Thornton published "An Enquiry into the Nature and Effects of the Paper Credit of Great Britain" in which he gave an account of his theory regarding the central bank's ability to control price level. According to his theory, the central bank could control the currency in circulation through bookkeeping. This control could allow the central bank to gain a command of the money supply of the country. This ultimately would lead to the central bank's ability to control the price level. His introduction of the central bank's ability to influence the price level was a major contribution to the development of the quantity theory of money.

The Phillips Model of Money wages/Inflation and Unemployment

The Phillips curve is a single-equation economic model, named after William Phillips (1958), hypothesizing an inverse relationship between rates of unemployment and corresponding rates of rises in wages that result within an economy. Stated simply, decreased unemployment, (i.e., increased levels of employment) in an economy will correlate with higher rates of wage rises. Phillips did not himself state there was any relationship between employment and inflation; this notion was a trivial deduction from his statistical findings. Paul Samuelson and Robert Solow made the connection explicit and subsequently Milton Friedman and Edmund Phelps put the theoretical structure in place. In so doing, Friedman was to successfully predict the imminent collapse of Phillips' a-theoretic correlation.

While there is a short run trade-off between unemployment and inflation, it has not been observed in the long run. In 1967 and 1968, Friedman and Phelps asserted that the Phillips curve was only applicable in the short-run and that, in the long-run, inflationary policies would not decrease unemployment. Friedman then correctly predicted that in the 1973–75 recession, both inflation and unemployment would increase. The long-run Phillips curve is now seen as a vertical line at the natural rate of unemployment, where the rate of inflation has no effect on unemployment. In the 2010s the slope of the Phillips curve appears to have declined and there has been controversy over the usefulness of the Phillips curve in predicting inflation. Nonetheless, the Phillips curve remains the primary framework for understanding and forecasting inflation used in central banks.

Empirical Framework

The effect of currency in circulation on rising inflation and unemployment has generated a large volume of empirical studies with mixed findings using cross sectional, time series and panel data. Some of these studies are country specific while others are cross country. Few of the empirical studies are selected for reviews in this section are as follows;

Bhattarai (2016) examined the relationship between inflation and unemployment in 35 OECDcountries using a panel VAR model to analyse the quarterly data used from 1990:1 to 2014:4. He submitted that the Phillip's curve is still significant in 28 out 35 OECD countries and the coefficients of Okun curve for growth on unemployment were significant only in 13 of these countries. He concluded that as the natural rate of unemployment results from the balance between job creation and destruction processes, reductions in unemployment rates require complementing macro stimulations by microeconomic structural and institutional reforms.

Amassoma and Nwosa (2013) examined the impact of unemployment on productivity growth in Nigeria using an error correction modelling approach and co-integration technique to analyse the data used from 1986 to 2010. The regression estimate based on the short run and long run models showed that unemployment rate had an insignificant influence on productivity growth in Nigeria over the study period.

Shadi Saraireh, (2020). Estimated the effects of Government spending on unemployment in Jordan for the period 1990 to 2019. By using the ARDL co-integration test and found a negative and statistically significant long-run relationship between government spending and the unemployment rate in Jordan. An increase in government spending by a per cent of GDP is found to reduce unemployment by about 0.43 percentage points in the same year. We also noticed that, in the short-run, government spending has a positive and significant impact on unemployment.

Ejikeme (2014) assessed the link unemployment and poverty has on security in Nigeria. His study underscores that unemployment and poverty are universal phenomena, and not necessarily a peculiar characteristic of any particular segment of the society. The research revealed that unemployment and poverty have direct links to security challenges in Nigeria.

Akeju and Olanipekun (2014) validated the Okun's law in Nigeria using the Error Correction Method and Johansen cointegration technique. The findings showed that there is both a short and long run relationship between unemployment rate and output growth in Nigeria. Hence, there is need to incorporate fiscal measures and increase the attraction of foreign direct investment (FDI) to reduce the high rate of unemployment in the country.

Muhammad (2014) studied the effect of inflation and unemployment on the growth of Pakistan from 1980 to 2010 using the Auto regressive distributed lag. He firstly noted that inflation ffect

varies from economy to economy, but most of the studies indicate that there is a positive relationship between inflation and economic growth or GDP. The result showed that there is a long run relationship between the variables. It was recommended that self-employment/entrepreneurship should be encouraged to overcome the unemployment.

Madito and Khumalo (2014) examined unemployment nexus in South-Africa form 1971Q1 to 2013Q4 using the Error correction mechanism as a result of the dynamic inter-relationship between the variables used to check the speed of adjustment of economic growth to unemployment crisis. It was observed that about 62 percent of economic growth is corrected each quarter. The overall results showed that there is a negative relationship between economic growth and unemployment in South Africa.

Mukhtar and Zakari (2010) investigated the relationship between money supply, deficit financing and inflation in Pakistan. The empirical findings suggested that in the long run inflation is not related to budget deficit but only to supply of money and supply of money has no causal connection with budget deficit.

Odusanya and Atanda (2010) analyzed the dynamic and simultaneous inter-relationship between inflation and its determinant in Nigeria between 1970 and 2001. The long run and short run mechanism of interaction between inflation and its determinants were examined using Augmented-Engle Granger cointegration test and Error Correction Mechanism (ECM) model. Their results suggest that inflation rate, growth rate of real output and money supply and real share of fiscal deficit are stationary at level, indicating cointegration of the variables. While other variables incorporated in the model such as import, exchange rate, interest rate are stationary at first difference.

Omoke and Ugwuanyi (2010) examined empirically the relationship between money, inflation and output in Nigeria. The authors employed cointegration and Granger causality test for analysis. The findings revealed no existence of cointegrating vector in the series used. Money supply was seen to granger cause both output and inflation. The result suggests that monetary stability can contribute towards price stability in the Nigerian economy since the variation in price level is mainly caused by money supply and also stated that inflation in Nigeria is to a large extent a monetary phenomenon.

Ifionu and Akinpelumi (2015) examined the effect and implication of selected macroeconomic variables on money supply (M2), using derived secondary data gotten from the Central Bank Statistical Bulletin (2013). Coupled with the application of econometric technique such as; O.L.S., causality test and Co-integration of time series data to estimate the long and short run relationship and causality of employed variables. The results revealed that all variables were stationary at various lags and there exists a long run relationship between variables employed and it was discovered that apart from inflation had an inverse significance with money supply (M2) and exchange Rate (EXR), all other variables such as gross domestic Product (GDP) were found to have a positive impact on money supply.

Malik (2006) studied the effects of monetary policy actions on inflation using Near-VAR approach. His results showed that effect of monetary policy transmits into inflation with a lag of half year and then take another year to reach the peak. This study suggested the identification of variables that are most important in explaining inflation in Pakistan by considering monetary policy actions, supply side factors and foreign inflation.

Olorunfemi and Adeleke (2013) studied the impact of money supply and inflation rate in Nigeria using secondary data that ranged between 1970-2008. The study used Vector Auto Regressive (VAR) model. The results revealed that money supply and exchange rate were

stationary at the level while oil revenue and interest rate were stationary at the first difference. Results from the causality test indicate that there exists a unidirectional causality between money supply and inflation rate as well as interest rate and inflation rate. The causality test runs from money supply to inflation, from the interest rate to inflation and from interest rate to money supply.

Loganathan et al. (2012) analysed the integration and dynamic interaction between monetary shock and overall unemployment in Malaysia for the period of 1980-2010.The study applied various unit root tests, Gregory-Hansen cointegration test, VECM and Granger causality test with considering the possibility of the structural break. The results show a structural break in the middle of 1990s with a long run co-integration between monetary shock and unemployment. However, there was no causality relation between both variables.

Cambazoğlu and Karaalp (2012) analysed the effectiveness of narrow credit view on employment and output for Turkey using money supply, total loans, employment rates and industrial production index monthly variables in a vector autoregressive (VAR) framework. It was found that changes in money stock (m2) impacts on employment and output.

Göçer (2013) examined the relationship between changes in money supply in terms of total lending of the banking sector and unemployment in fourteen selected European Union countries for the 1980-2012 period using panel data analysis method that takes into consideration structural breaks and cross-section dependence. The analysis shows a reduction in unemployment rate in these countries being attributed to increase in lending.

Mehmood and Sadiq (2010) examined the relationship between government expenditure and unemployment rate in Pakistan for the period 1976 to 2010, using an error correction modelling technique. The study revealed that a negative relationship exists between government expenditure and unemployment rate in Pakistan.

Holden and Sparrman (2016) estimated the effect of government purchases on unemployment in 20 OECD countries, for the period 1980-2007. Their study revealed that an increase in government purchases equal to one percent of GDP reduces unemployment by about 0.3 percentage point in the same year.

Samira and Khalil (2015) examined the government civil expenditures effect on unemployment rate in Iran from 1997-2013 period using the generalized ADF unit root test, Johansen cointegration test, (VAR) method and VEM. The long period relationship was analysed and a negative and meaningful relation of total government civil expenditure on unemployment rate was established.

Khairulamri and Nazamuddin, (2018). Investigated the relationship between the export and employment creation in Indonesia. Using time series data for the period of 1987-2013. Johanson co-integration test employed to determine the long-run relationship between the variables. Vector autoregressive and Granger causality test utilized to test the short-run relationship between the variables. The study found that in the long-run, there is no relationship between employment and export. In a short-run, the employment positively and significantly causes the export. Granger causality test indicates that there is unidirectional causality running from the export to employment.

Monfared and Akın (2017) analysed the relationship between exchange rates and inflation based on time series data, using Hendry General to Specific Modeling method and Vector Autoregression (VAR) model. it is obtained that there is a direct relationship between

Exchange rate and inflation. It further revealed that both the money supply and the exchange rate affect the inflation in the positive direction.

3.0 Methodology

Nature and Sources of Data

In this study, econometric techniques are applied to analyse hypothetical relationships between variables, as this is geared towards the purpose of enabling us to provide solution to research problems. To address this research problem, the methodologies adopted in this study are split into two categories; firstly, ex post facto design is adopted to analyse annual time-series data on study monetary variables such as: Money supply, Exchange rates and prime Lending rates and inflation rate; which are all obtained from Central Bank of Nigeria and National Bureau of Statistics, except inflation which is obtained from World Bank. Money supply value is in Billions of Naira, whereas, official exchange rate, inflation rate and prime lending rate are in percentage from 1985 to 2020 respectively. And secondly, quantitative technique is adopted to analyse annual time-series data of fiscal variables such as: government total expenditure, government tax revenue and export which are in billions of Naira except export that is in millions of naira, and are obtained from federal ministry of finance, office of the accountant general of the federation & Central Bank of Nigeria, and data on unemployment rate that is obtained from World Bank ranging from 1985 to 2020 respectively.

Model Specification

This study follows the quantity theory of money by Nicolaus Copernicus (1517) . The theory sees that the general price level of goods and services is directly proportional to the amount of money in circulation or money supply. For example, if the amount of money in an economy doubles, QTM predicts that price levels will also double. And also anchored on William Phillips (1958) curve who examined the relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957, the theory observes an inverse relationship between money wage changes and unemployment in the British economy over the period examined. In the light of these two theories, the models which are used for investigating the monetary variables and inflation rate in Nigeria is based on the one proposed by Olorunfemi and Adeleke (2013) with modification. The authors proposed that inflation is affected by money supply (MS), exchange rate (EXCHR), interest rate (INTR), oil revenue (Oil Rev). In this study, the model is modified to include Prime Lending rates (PLR). And also, Following the research work of Nwosa (2014) in assessing the effect of expenditure (GEXP) on unemployment and poverty rates in Nigeria over the period 1981-2011. The adapted form of the model is expressed in a multiple regression and modified with the incorporation of exogeneous factors considered includes: government tax revenue (GTR), the export (EXPT) which may significantly influence unemployment rate as veritable instruments of fiscal variables. Hence, the functional form of the model is represented as follows;

Model 1:

$$UNEMPLR = f(GEXP, GTR, EXPT) \quad \ldots\ldots (1)$$

From the above equation the model can be re-written as follows;

$$UNEMPLR = \beta_0 + \beta_1 GTEXP + \beta_2 GTR + \beta_3 EXPT + \mu \quad \ldots\ldots (2)$$

Where;

UNEMPLR = unemployment rate (dependent variable)

GTEXP = government total expenditure (explanatory variable)

GTR = government tax revenue (explanatory variable)

EXPT = export (explanatory variable)

B_0 = parameter constant; β_1 = parameter of government total expenditure

β_2 = parameter of government tax revue; β_3 = parameter of export tax rate

μ = Idiosyncratic error

The general expression of vector error correction model is specified as follows:

$$\Delta UNEMPR_t = \sigma + \sum_{i=1}^{k-1} \beta 1 \Delta UNEMPR_{t-1} + \sum_{j=1}^{k-1} \beta 2 \Delta GTEXP_{t-1} + \sum_{m=1}^{k-1} \beta 1 \Delta GTR_{t-1\ t} + \sum_{q=1}^{k-1} \phi \Delta EXPT_{t-1} + \lambda ECM_{t-1} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where; σ = constant; k-1 = the lag length

β,ϕ,φ = short-run dynamic coefficients of the model's adjustment log-run equilibrium.

λ = speed of adjustment parameter.

ECM = lagged value of the residuals obtained from the co-integrating regression of the dependent variable on the regressors, which contains long-run information derived from the long-run co-integrating relationships;

μt = Residual (stochastic error term; often called impulses, innovations or shocks).

Model 2:

Therefore, the functional form of monetary variables on inflation in Nigeria is illustrated as:

INFLR = f (M2, EXCHR, PLR) ……..... (1)

From the above equation, the model can be illustrated in econometrics as follows;

$INFLR = \beta_0 + \beta_1 M2 + \beta_2 EXCHR + \beta_3 PLR + \mu$ …… (2)

Where;

INFLR = Inflation rates (dependent variable)

M2 = Money supply (explanatory variable)

EXCHR = Exchange rate (explanatory variable)

PLR = Prime Lending rate (explanatory variable)

B_0 = parameter constant; β_1 = parameter of money supply

β_2 = parameter of exchange rates; β_3 = parameter of lending rate

μ = Idiosyncratic error

Autoregressive Distributive Lag (ARDL) model is expressed hereunder as follows;

$$\Delta LOGINFLR_{t-1} = \beta_0 + \sum_{t-1}^{M} \beta 1\ \Delta LOGINFLR_{t-1} + \sum_{t-1}^{N} \beta 2\ \Delta LOGM2_{t-1} + \sum_{t-1}^{P} \beta 3 \Delta LOGOEXCHR_{t-1} + \sum_{t-1}^{Q} \beta 4\ \Delta LOGPLR_{t-1} + \square_1 LOGINFLR_{t-1} + \square_2 LOGM2_{t-1} + \square_3 LOGOEXCHR_{t-1} + \square_4 LOGPLR_{t-1} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$$\Delta LOGM2_{t-1} = \beta_0 + \sum_{t-1}^{M} \beta 1\ \Delta LOGM2_{t-1} + \sum_{t-1}^{N} \beta 2\ \Delta LOGINFLR_{t-1} + \sum_{t-1}^{P} \beta 3 \Delta LOGOEXCHR_{t-1} + \sum_{t-1}^{Q} \beta 4\ \Delta LOGPLR_{t-1} + \square_1 LOGM2_{t-1} + \square_2 LOGLQR_{t-1} + \square_3 LOGOEXCHR_{t-1} + \square_4 LOGPLR_{t-1} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.1)$$

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$\Delta LOGLOEXCHR_{t-1} = \beta_0 + \sum_{t-1}^{M} \beta 1\ \Delta LOGOEXCHR_{t-1} + \sum_{t-1}^{N} \beta 2\ \Delta LOGM2_{t-1} + \sum_{t-1}^{P} \beta 3 \Delta LOGINFLR_{t-1} + \sum_{t-1}^{Q} \beta 4\ \Delta LOGPLR_{t-1} + \square_1 LOGLOEXCHR_{t-1} + \square_2 LOGM2_{t-1} + \square_3 LOGINFLR_{t-1} + \square_4 LOGPLR_{t-1} + \varepsilon_{it}$ ……..(3.2)

$\Delta LOGPLR_{t-1} = \beta_0 + \sum_{t-1}^{M} \beta 1\ \Delta LOGPLR_{t-1} + \sum_{t-1}^{N} \beta 2\ \Delta LOGM2_{t-1} + \sum_{t-1}^{P} \beta 3 \Delta LOGOEXCHR_{t-1} + \sum_{t-1}^{Q} \beta 4\ \Delta LOGINFLR_{t-1} + \square_1 LOGPLR_{t-1} + \square_2 LOGM2_{t-1} + \square_3 LOGOEXCHR_{t-1} + \square_4 LOGINFLR_{t-1} + \varepsilon_{it}$ …….. (3.3)

Where:

Δ stands for the first difference operator; β_0 stands for constant term

β_1 - β_5 stand for short-run elasticities (Coefficients of the first-differenced explanatory variables)

$\square_1$ - $\square_5$ stand for long-run elasticities (coefficients of the explanatory variables)

ì = 1, …, M; N, P, Q, are optimal lag orders

ε_{it} stands for vector of the error terms – unobservable zero mean white noise vector process (serially uncorrelated or independent).

A prior expectation

It is expected from **Model 1** that government total expenditure and export would have positive impact on unemployment rate. That is; β_1 and $\beta_3 > \beta_0$. Whereas, government tax revenue would have negative effect on unemployment. That is, $\beta_2 < \beta_0$

Similarly, it is expected from **Model 2** that money supply and prime lending rate would have negative effects on inflation respectively, that is, β_1 and $\beta_1 < 0$. Whereas, exchange rate would have positive effect on inflation, that is, $\beta_2 > 0$.

Data Estimation Techniques

This study employs dual techniques to analyse its data: firstly, the Autoregressive Distributed Lag (ARDL) approach to co-integration proposed by Pesaran et al. (2001) is adopted to empirically analyse the long-run and short-run effects of monetary variables on inflation rate in Nigeria for the periods of 1985 to 2020. The bounds testing is employed to examine the long-run relationship between the variables in the model. If the study variables are cointegrated, the long-run ARDL model are estimated and also the speed of adjustment are found. In ARDL analysis, long-run and short-run coefficients are estimated simultaneously, and model could be developed and utilized for co-integration test. ARDL model is used when the series are of mixed integration at order one, 1(1) and at level, 1(0), but none is integrated at second differencing, 1(2) (Pesaran, Shin, & Smith, 2001). Monetary variables at levels tend to show geometric growth and required taking their logarithms to linearize their movement through time. Hence, the study transforms INFLR, M2, EXCHR, and PLR into their natural logarithm shape to capture the elasticity of the respective variables. The log transformation allows the interpretation of the coefficients as elasticities. The ARDL technique of the regression equation estimated was specified in equation 3 in model 2. Similarly, the Vector Error Correction Method (VECM) is adopted to analyse series the results of co-integration test confirm to have their long-run co-integration relationship. VECM is used to analyse, specifically, when at least there is evidence of one co-integration equation reported by the results of Johansen co-integration test or any other test of this kind. Fiscal variables: UNEMPR, GTEXP, GTR, and EXPT are transformed into their natural logarithm form to capture the elasticity of the respective variables. As this allows the interpretation of the coefficients as elasticities.

4. Results and Discussion

Model 1: Unit Root Test

As the study deals with two models – firstly the study conducts stationarity test on first model of fiscal variables to check the level of stationarity properties of the variables under study, so as to guard against spurious regression. The test is conducted with the application of widely recognised unit root test of Augmented Dickey-Fuller (1979) method called Augmented Dickey-Fuller (ADF) at level and it is revealed that none of the variables is stationary at level I(0), though the study variables (such as: UNEMPR, GTEXP,GTR, EXPT) later became stationary at 1st Difference (order of Integration) this necessitates us to employ Johansen (1988) with lag 2 for testing for long-run relationship, the results are shown in Table 4.1 below.

Model 1: Unit Root Estimated Results

Table 4.1 Augmented Dickey-Fuller Results

SERIES	ADFT LEVEL	CRITICAL LEVEL	ORDER OF INTEGRATION	P-VALUE
UNEMPR	-1.915929	-2.954021	I(0)	0.3212
D(UNEMPR)	-6.6878702	-2.954021	I(1)	0.0000
LOG(GTEXP)	-2.130537	-2.951125	I(0)	0.2345
D(LOG(GTEXP))	-6.789589	-2.951125	I(1)	0.0000
LOG(GTR)	-2.382940	-2.948404	I(0)	0.1536
D(LOG(GTR))	-5.971660	-2.951125	I(1)	0.0000
LOG(EXPT)	-2.415522	-2.948404	I(0)	0.1449
D(LOG(EXPT))	-5.890756	-2.951125	I(1)	0.0000

Source: Author's computation with E-view 10 Software: 5% Level of Significance

Table 4.1 above represents the result of the stationarity test by employing Augmented Dickey-Fuller unit root test at 5% level of significance. The estimated results show that all the variables such as UNEMPR, GTEXP, GTR, and EXPT are not stationary at level I(0). However, the study variables became stationary at 1st Differencing at 5% critical level. This claim is evidenced by their respective P-values. After achieving stationarity after 1st Differencing it means that the series under study possess long-run properties. Hence, since all the variables are shown to possess stationarity properties after 1st differencing, it implies therefore, that the series are integrated of the same order one.

Model 1: Co-integration Test

This test is employed essentially to determine the long-run relationship among the study variables. In this study, the study variables used are unemployment rate (UNEMPLR), government total expenditure (GTEXP), government tax revenue (GTR) and export (EXPT). Thus, Johansen co-integration test is adopted to test for the presence of this long-run relationship among the series of the same order of integration via forming a co-integration equation. The reason of this co-integration is that, if in the long-run, two or more variables

move closely together, it would suggest that the series are defining a long-run relationship as the differences between them are stationary. On the contrary, lack of co-integration shows that the series do not have long-run relationship. The result of the Johansen co-integration test with lag 2 is displayed in table 4.2a below.

Table 4.2a: Unrestricted Co-integration Rank Test (Trace) for the series; UNEMPR and the explanatory fiscal variables; GTEXP, GTR, EXCHR, EXPT.

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05-C-Value**	**Prob.****
None*	0.560892	54.91158	47.85613	0.0094
At Most 1	0.416911	27.75227	29.79707	0.0845
At Most 2	0.236328	9.951573	15.49471	0.2845
At Most 3	0.031441	1.054200	3.841466	0.3045

Trace test indicates 1 co-integrating equation(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**Mackinnon-Haug-Michelis (1999) P-values

Table 4.2b: Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical-Value**	**Prob.****
None	0.560892	27.15931	27.58434	0.0566
At Most 1	0.416911	17.80070	21.13162	0.1375
At Most 2	0.236328	8.897373	14.26460	0.2948
At Most 3	0.031441	1.054200	3.841466	0.3045

Trace test indicates no co-integrating equation(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**Mackinnon-Haug-Michelis (1999) P-values

Table 4.2a & table 4.2b above represent the estimated result of the Johansen co-integration equation, the result indicates 1 co-integration equation as evidenced by Trace statistic. Whereas, the estimated result of Maximum Eigenvalue statistic shows no co-integration equation. Based on the Trace statistic result, this infers that there is existence of long-run equilibrium relationship among the study fiscal variables.

Model 1: Vector Error Correction Model (VECM)

The presence of long-run equilibrium relationship exists among the variables as indicated by the results of Johansen co-integration leads to the application of Vector Error Correction Model (VECM). Vector Error Correction Model (VECM) is adopted to determine the short-run dynamics and long-run equilibrium relationship among the fiscal variables under study. The results are presented below in table 4.3

Table 4.3: VECM Estimation Results

Variables	Coefficient	Std. Error	t-Statistic	Prob
CoinEq1	-0.617173	0.121316	-5.087298	0.0000
D(UNEMPR(-1))	0.537322	0.136039	3.949756	0.0005
D(LOG(GTEXP(-1))	-0.309765	0.324994	-0.953142	0.3487
D(LOG(GTR(-1))	-0.265058	0.376231	-0.704509	0.4869
D(LOG(EXPT(-1))	0.451518	0.276531	1.632790	0.1137
C	0.023125	0.080335	0.287858	0.7756

R-Squared = 0.568154; F-statistic = 7.367595; Prob(F-statistic) = 0.000162; DW Statistic = 1.698396

Source: Author's computation with E-view 10 Software

Table 4.3 above explains the results of the Error Correction Term (VECM). The estimated results show that the a priori expectation is met, and as well satisfied the stability condition of the study. This suggests that the estimated results possess the desired signs for each equation. The error correction term (ECT) value is -0.617173 with its P-value being 0.0000. The result means that the speed of adjustment towards long-run equilibrium from short-run disequilibrium is 61.71% annually. Furthermore, the estimated results indicate that the coefficients of government total expenditure (GTEXP), and government tax revenue (GTR), are -0.309765, and -0.265058 respectively with their corresponding P-values being 0.3487, and 0.4869 which implies that their respective coefficients are negative and statistically insignificant. Hence, it is estimated on the average that 1% increase in government total expenditure (GTEXP), and government tax revenue (GTR),) will result to 30.97% and 26.50% decrease in unemployment rate (UNEMPR) respectively. This study is in relationship with the finding of Shadi Saraireh, (2020) who Estimated the effects of Government spending on unemployment in Jordan for the period 1990 to 2019, and found a negative and statistically significant relationship between government spending and the unemployment rate. Similarly, the estimated result indicates that the coefficient of export (EXPT), is 0.451518 with its corresponding P-value being 0.1137 which implies that its coefficient is positive and statistically insignificant. Hence, it is estimated on the average that 1% increase in export (EXPT) will positively result to 45.15% increase in unemployment rate (UNEMPR). Also, this finding conforms to the finding of Khairulamri and Nazamuddin, (2018). That found that in the short-run, there is positive and significant relationship between employment and export. More so, the estimated results also reveal that F-statistic value is 7.367595, with its associated Prob(F-statistic) value is 0.000162, which implies that the joint influence of the explanatory variables (GTEXP, GTR, and EXPT) on the dependent variable (UNEMPR) is statistically significant. Furthermore, the commuted coefficient of multiple determination (R^2) value is 0.568154. The result means that 56.81% of

the variations in UNEMPR are explained by the explanatory fiscal variables such as GTEXP, GTR, and EXPT while the remaining 43.19% of variations are attributed to other factors not included in the model. In the same vein, the estimated result shows that the value of Durbin Watson Statistic is 1.698396, which implies that there is evidence of positive serial correlation found in the model, this is because it is below 2.

Model 1: Diagnostic Test

The last issue addressed in the analysis is associated with the reliability of the VECM. For this reason, diverse diagnostic tests are performed. The diagnostic tests are serial correlation, heteroscedasticity.

Table 4.4 VECM Diagnostic Tests

Null Hypothesis: No Serial Correlation			
Lag	Rao F-stat	Df	Prob
1	1.089307	(16,64.8)	0.3833
Null Hypothesis: No heteroscedasticity			
Lag	Chi-sq.	Df	Prob.
2	207.5440	180	0.0780

The results reported in Table 4.4 above indicate that the residuals are free from challenges of heteroscedasticity, higher-order autocorrelation in the model. This implies that the results from the estimation are robust and reliable for making inferences.

Model 2: Unit Root Test

The study also conducts stationarity test on monetary variables (such as: INFLR, M2, EXCHR, PLR) to check the level of stationarity properties of the study variables in order to guard against spurious regression. The study employs the application of Phillip-Peron (1988) to conduct the unit root test, and the result of the test shows that the time-series data are of mixed integration, that is, a combination of I(0) and I(1) variables. This circumstance necessitates the application of the ARDL estimation technique (Pesaran et al., 2001). The results are displayed in Table 4.5 below.

Model 2: Unit Root Estimated Results

Table 4.5 Phillip-Peron Unit Root Test Results

SERIES	PPT LEVEL	CRITICAL LEVEL	ORDER OF INTEGRATION	P-VALUE
D(INFLR)	-3.149698	-2.881685	I(0)	0.0252
LOG(M2)	-1.606147	-2.881685	I(0)	0.4768
D(LOG(M2))	-15.39287	-2.881830	I(1)	0.0000
LOG(EXCHR)	-2.824064	-2.881685	I(0)	0.0574
D(LOG(EXCHR))	-12.58741	-2.881830	I(1)	0.0000
LOG(PLR)	-3.335274	-2.881685	I(0)	0.0151

Source: Author's computation with E-view 10 Software: 5% Level of Significance

Model 2: ARDL Bounds test of co-integration

After establishing the stationary status of the study monetary variables with the use of Phillip-Peron test – the study proceeds with the ARDL Bounds Testing to form a possible long-run relationship between the study variables. Here, position of the null Hypothesis of no co-integration is rejected if the F-statistic is less than the 5% critical value in the lower I(0) and the upper I(1) bounds respectively, otherwise we to reject, if it is greater than 5% critical value. Maximum lag length is based on automatic selection. The estimated F-bounds test results are summarised in table 4.5 below.

Table 4.5 ARDL Bounds testing Results

F-Bounds Test		Null Hypothesis: No Level Relationship		
Test Statistic	**Value**	**Signif.**	**I(0)**	**I(1)**
F-statistic	7.387256	10%	2.72	3.77
K	3	5%	3.23	4.35
		2.5%	3.69	4.87
		1%	4.29	5.61

Author's computation with E-view 10 Software

The bounds testing result indicates that the null hypothesis of no evidence of co-integration is rejected at 5% level of significance as there is evidence of co-integrating relationship in the model encouraged by the predictor monetary variables (such as: M2, EXCHR, and PLR). This infers that inflation rate (INFLR), money supply (M2), exchange rate (EXCHR), and prime

lending rate (PLR) are bound by a long-run relationship. The long-run relationship among the variables is confirmed as the calculated F-ratio (INFLR, M2, EXCHR, and PLR) = 7.387256 which is greater than the upper bound critical value of 4.35 and lower bound of 3.23% at the 5% level of significance. The implication of this cointegrating relationship is that inflation rate is driven by changes in monetary variables over a long period. Thus, it can be concluded that predictor monetary variables (M2, EXCHR, and PLR) collectively explained variations in inflation rate (INFLR).

ARDL Long-run test of explanatory monetary variables on inflation

To examine the long-run effect of explanatory monetary variables (M2, EXCHR, and PLR) on explained monetary variable (INFLR), the study estimates the conditional ARDL long-run model for equation 3 above. The study chooses the Akaike Information Criteria (AIC) to guide the choice of the lag length; automatically, selecting 4 as the maximum number of lags for both the regressand and the regressors. The long-run and short-run coefficients from the equation above are therefore estimated using an optimally determined lag length of (2, 0, 3, 3) and the results are displayed in Table 4.6a below.

Table 4.6a ARDL Long-run estimated results

Variables	coefficient	Std. Error	t-Statistic	Prob.
C	-0.420363	3.360382	-0.125094	0.9016
INFLR(-1))*	-1.005237	0.201653	-4.984980	0.0001
LOG(M2)**	0.263994	0.196744	1.341815	0.1940
LOG(EXCHR(-1))	-0.685005	0.301799	-2.269742	0.0339
LOG(PLR(-1))	1.333632	1.073072	1.242817	0.2276
D(INFLR(-1))	0.630748	0.200333	3.148500	0.0048
DLOG(EXCHR)	-0.584315	0.409436	-1.427119	0.1682
DLOG(EXCHR(-1))	0.326993	0.411620	0.794406	0.4358
DLOG(EXCHR(-2))	0.749466	0.352955	2.123405	0.0458
DLOG(PLR)	-0.582607	0.694015	-0.839473	0.4107
DLOG(PLR(-1))	-1.892336	0.663474	-2.852164	0.0095
DLOG(PLR(-2))	-0.978884	0.538421	-1.818064	0.0833

Source: Author's Computation with E-view 10 Software

The coefficient (-1.005237) and its corresponding P-value being (0.0001) of INFLR(-1) portrays that the observed value of inflation rate of the previous year has negative, but significant effect on current year's inflation. The long-run coefficient of money supply (LOG(M2) portrays a positive relationship with inflation rate that is insignificant at 5% level. Based on this result, it implies that a percentage increase in money supply (M2), other things

being equal, would cause about 0.26% increase in inflation rate. This result is in tandem with economic theory which postulates that, if there is too much money in the economy that will trigger inflation. More so, the long-run coefficient of exchange rate (LOG(EXCHR) shows negative sign on inflation that is insignificant at 5% level. Based on this result, it infers that if exchange rate (EXCHR) appreciate by a percentage, other things being equal, it would reduce the rate of inflation by 0.58% in the system. Furthermore, the long-run coefficient of prime lending rate (LOG(PLR) displays negative relationship with inflation. Based on this result, this suggests that a one percentage increase in prime lending rate (PLR), ceteris paribus, would cause 0.58% reduction in inflation rate. This result is in conformity with the a priori expectation.

ARDL Short-run test of explanatory monetary variables on Inflation

The error correction mechanism (ECM) gives information on the speed of adjustments and short-run coefficients of the ARDL model, whilst the differenced coefficients of the explanatory variables show the short-run dynamics. Put it differently, the estimated ECM provides clue on the speed at which inflation rate returns to equilibrium after a shock to the explanatory monetary variables, the results are shown in Table 4.6b below.

Table 4.6b ARDL Short-run estimated results

Variables	coefficient	Std. Error	t-Statistic	Prob.
C	-0.420363	0.112675	-3.730763	0.0012
D(INFLR(-1))	0.630748	0.178306	3.537447	0.0020
DLOG(EXCHR)	-0.584315	0.359069	-1.627305	0.1186
DLOG(EXCHR(-1))	0.326993	0.330600	0.989090	0.3339
DLOG(EXCHR(-2))	0.749466	0.286038	2.620167	0.0160
DLOG(PLR)	-0.582607	0.517947	-1.124839	0.2734
DLOG(PLR(-1))	-1.892336	0.537019	-3.523781	0.0020
DLOG(PLR(-2))	-0.978884	0.476741	-2.053284	0.0527
ECM(-1)*	-1.005237	0.172982	-5.811223	0.0000

Source: Author's Computation with E-view 10 Software

The Error Correction Model (ECM(-1) portrays the speed of adjustment required to restore equilibrium in the dynamic model after an innovation, it affirms a priori expectation as its coefficient is negative and has a P-value that statistically significant at 5% level. Its value of -1.005237 implies that an impulse to Inflation rate in the current period will be restored at a speed of adjustment of about 1.05% in the next period. Hence, the rate of adjustment of a short-run disequilibrium in inflation is moderately fast as about 1.05% of divergence in inflation rate as a result of a current period shock will converge towards long-run equilibrium in the next period. From Table 4.6b, the current year value of INFLR was significantly affected by the lagged or previous years' value of INFLR. Specifically, a percentage increase in one year

lagged value of INFLR; D(INFLR(−1)) portrays a positive effect on current year value of INFLR and was highly significant at 5% level. The coefficient of present level of exchange rate DLOG(EXCHR) in agreement with the long-run result exhibited a negative relationship with the current rate of inflation and is significant at 5% level. Thus, a percentage increase in the present level of exchange rate, holding other explanatory variables constant, triggered a decrease in current level of INFLR by approximately 0.58%. However, the coefficient of the one-year lagged measure of exchange rate DLOG(EXCHR(−1)) is in agreement with the long-run result displaying a positive effect on the current rate of inflation (INFLR) that is insignificant at 5% level. In the same vein, the two-year lagged value of exchange rate DLOG(EXCHR(−2)) also shows a positive effect on current level of inflation rate and is significant at 5% level. The finding is in line with the finding of Sanam Shojaeipour Monfared and Fetullah Akın. (2017), who obtained that both the money supply and the exchange rate affect the inflation in the positive direction.

More so, the estimated coefficient of present level of prime lending rate DLOG(PLR) in agreement with the long-run result which is negatively related to the current rate of inflation and insignificant at 5% level. Hence, a percentage increase in the present level of prime lending rate, holding other explanatory variables constant, inspires a sharp decrease in current level of INFLR by approximately 0.58%. This result conforms to a priori expectation which expresses an inverse relationship between prime lending rate and inflation rate. This relationship forms one of the central tenets of contemporary monetary policy that when central bank manipulates short-term prime lending rate it directly affects the rate of inflation in the economy in the long-run. In the same vein, a percentage increase in the one-year lagged value of prime lending rate, D(LOGPLR (−1)) is associated with a negative effect of decreasing the current rate of inflation (INFLR) by about 1.89% that is significant at 5% level in the long-run and short-run. Similarly, the two-year lagged value of prime lending rate DLOG(PLR(−2)) also show negative effects on current level of inflation and both insignificant at 5% level in the log-run and short-run.

Model 2: Diagnostic Tests

Addressing this last issue is to conduct some diagnostic econometric tests that is associated with the reliability of the ARDL model. For this reason, various diagnostic tests are conducted. These diagnostic tests are serial correlation, heteroscedasticity, Ramsey's RESET test as well as Jarque-Bera normality test. The results from these tests which are reported in Table 4.6c disclose that the ARDL is free from challenges of misspecification, heteroscedasticity, higher-order autocorrelation or non-normality in the model. This hints that the results from the ARDL estimation are robust and reliable for making inferences. Also, the graphs of the CUSUM and CUSUM of Square indicate that the model is stable as the parameters of the estimated model are within the critical bounds at 5% critical level, implying that the estimated model is dynamically stable and the entire model is in good econometric health, the results are displayed in table 4.6c below.

Table 4.6c Residual Diagnostic Tests

Test	Conclusion	F-statistic	Prob-value
Jarque-Bera	Normal Distribution	0.066332	0.967378
Breusch Godfrey	No Serial correlation	1.379856	0.2757
Breusch-Pagan Godfrey	No Heteroscedasticity	1.779471	0.1228
Ramsey Reset	No Misspecification	2.243593	0.1334

Source: Author's computation

Figure 1: Stability Test Result (CUSUM)

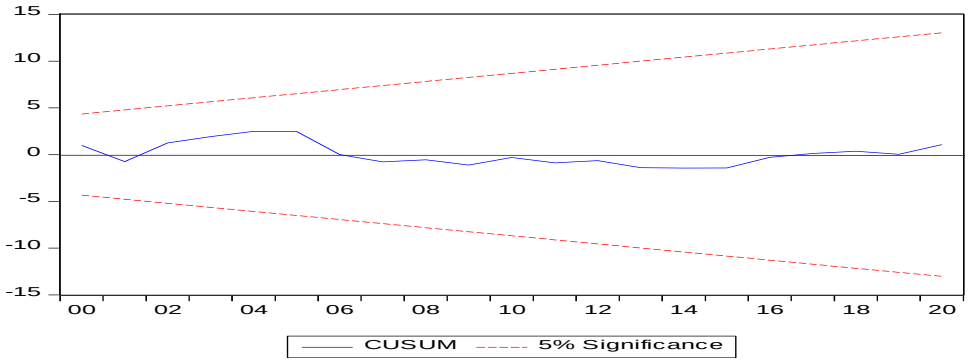
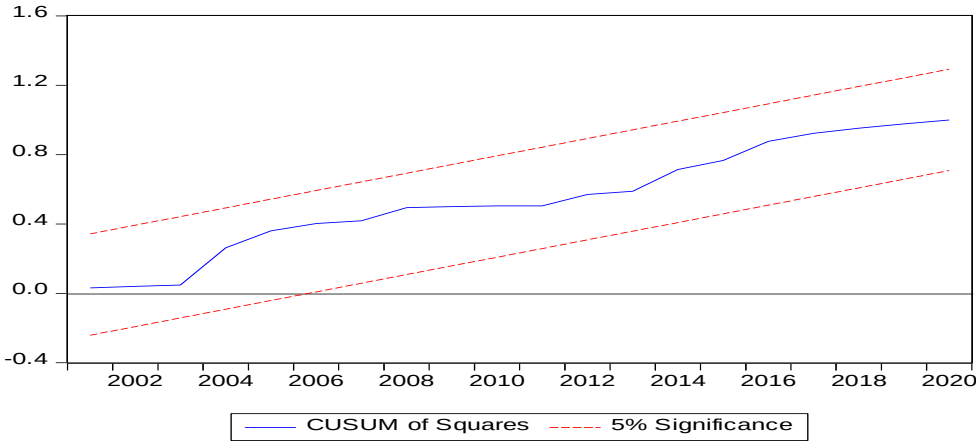


Figure 2: Stability Test Result (CUSUM of Square)



5. Conclusion and Policy Recommendations

Inflation and unemployment have been subjected to macroeconomic analysis for decades, this is because, they are both macroeconomic problems. Hence, this is one of the reasons, this study was carried out to investigate the effect of insufficient currency in circulation on the rate of inflation and unemployment in Nigeria: the Buhari's administration experience. This objective was achieved by disaggregating the study into two models – one was to capture fiscal variables (GTEXP, GTR, EXPT) to regress them against unemployment rate (UNEMPR), with the

application of Vector Error Correction Model (VECM) for the analysis of annual time-series data from 1985-2020. And two was to capture monetary variables (M2, EXCHR, PLR) to regress them against inflation rate (INFLR), with the use of ARDL-Bounds testing approach for the analysis of annual time-series data from 1985-2020. The empirical analyses were anchored on the quantity theory of money by Nicolaus Copernicus (1517). And on theory of unemployment and the rate of change of money wage rates by William Phillips (1958). Based on this, it was revealed from the unit root of Augmented Dickey-Fuller test that none of the (fiscal) variables was stationary at level, but they were all stationary after 1st Differencing this made it necessary for the study to apply Johansen co-integration test which the estimated result indicated 1 co-integration equation as evidenced by Trace statistic.

The estimated result from VECM revealed that it took 61.71% annual speed of adjustment towards long-run equilibrium from short-run disequilibrium. That is, how rapidly unemployment rate returned to equilibrium after a shock to fiscal variables (GTEXP, GTR, and EXPT). The result further explained that government total expenditure (GTEXP), and government tax revenue (GTR), had negative and insignificant impact on unemployment rate respectively which implied that on the average as government increases its total expenditure (GTEXP), and tax revenue (GTR),) the rate of unemployment (UNEMPR) reduced. Similarly, the estimated result indicated that the value of export (EXPT), had positive impact on unemployment rate, which implied that on the average as export (EXPT) increased unemployment rate (UNEMPR) was caused to increase as well. More so, in analysing monetary variables (money supply, exchange rate and prime lending rate) in model 2: Phillip-Peron unit root test was conducted and it was confirmed that the variables were of mixed order of integration which necessitated the employment of ARDL technique. The short-run estimated results of Autoregressive Distributed Lag (ARDL) revealed that its value of -1.005237 which caused a shock to Inflation rate in the current period will be restored at a speed of adjustment of about 1.05% in the next period. Suggesting that the rate of adjustment of a short-run disequilibrium in inflation is moderately fast as about 1.05% of divergence in inflation rate as a result of a current period shock converged towards long-run equilibrium in the next period.

The result further revealed that in the long-run money supply caused inflation rate to rise. Similarly, the result revealed that present level of exchange rate decelerated inflation rate in both long-run and short-run. It was further observed that the one-year lag of exchange rate increased rate of inflation in both log-run and short-run. Whereas, the two-year lag of exchange rate increased inflation rate in the long-run and short-run as well. The estimated result further revealed that the present level of prime lending rate minimised the rate of inflation in the long-run and short-run. The result further confirmed that in the short-run one-year lag of prime lending rate reduced inflation rate in the long-run. Similarly, the result further showed that two-year lag of prime lending rate also reduced inflation rate in both log-run and short-run. As a result of these findings, with respect to model 1; the study recommended that government should maintain the level of its expenditure and tax revenue as this reduced unemployment rate, and it should lower trade costs so that demand for labour would increase in the export industry, this would make aggregate unemployment rate to reduce. With respect to model 2; it recommended the adoption of contractionary monetary policy that would minimise the amount of money supply that caused long-run effect on inflation in the system. Furthermore, there should be proper maintenance of fixed exchange rate policy that will make exchange rate regime overcome non-military forces of demand and supply in exchange rate market, this will help maintain low rate of inflation.

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